1. **Introduction**

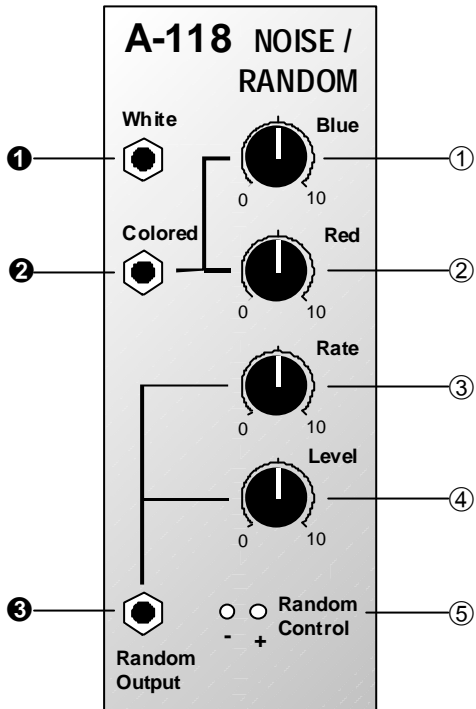Module **A-118 (NOISE / RANDOM)** is (as you might have guessed) a **noise and random voltage generator.**

It produces three types of signal: **white noise, colored noise,** and **random voltage.**

White and colored noise can be used as audio sources, and also, in conjunction with a sample & hold module, as control voltages, and the random voltage is a useful source of voltage control, especially for its low frequency content.

The A-118 gives you the ability to mix the relative amounts of **Red** (low frequency component) and **Blue** noise (high frequency component) in the colored noise output.

There are knobs to control the **rate of change** and **amplitude** of the random voltage, and two LEDs indicate the state of the voltage at any one time.

2. NOISE / RANDOM - Overview

A-118 NOISE / RANDOM

White ❶
Blue ①
Colored ❷
0   10
Red ②
0   10
Rate ③
0   10
Level ④
0   10
Random Output ❸
Random Control ⑤
- +

Controls:

1 Blue: Control for blue noise component at colored noise output **"**

2 Red: Control for red noise component at colored noise output **"**

3 Rate: Control for the cycle time of the random voltage at output **§**

4 Level: Control for the amplitude of the random voltage at output **§**

5 Random Control: LEDs indicating the state of the random voltage at output **§**

In / Outputs:

!   White: White noise output

"   Colored: Colored noise output

§   Random Output: Random voltage output

3. Controls

The A-118 produces white and colored noise. **White noise** contains all audio frequencies, at random amplitude.   The spectrum of white noise is completely flat - ie. each section of the sound spectrum contains the same amount of energy (see Fig. 1).

Another type of noise is **pink noise**. This also contains all audio frequencies, but with equal weighting for each octave rather than each frequency, so the higher frequencies get progressively quieter (see Fig. 1).
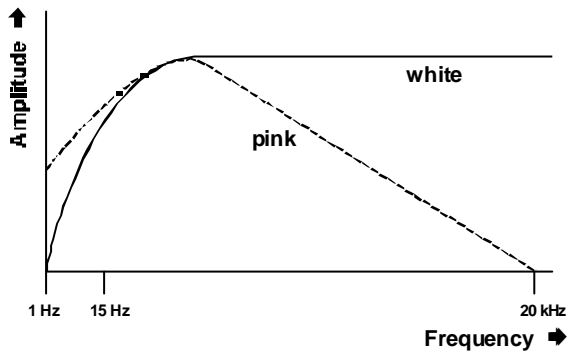

Fig. 1: Spectra of white and pink noise

1 Blue

Use control **1** to adjust the amount of **blue noise** (the **high frequency components**) in the signal at output **"** .

2 Red

Use control **2** to adjust the amount of **red noise** (the **low frequency components**) in the signal at output **"** .

3 Rate

Use control **3** to adjust the **cycle time T** of the random voltage at output **§**. T is a theoretical figure, because of the random voltages the module produces. In practice, a setting of 0 on the knob means fast changes in voltage, producing a spectrum similar to pink noise (see Fig. 2); and 10 means slow changes (see Fig. 3).
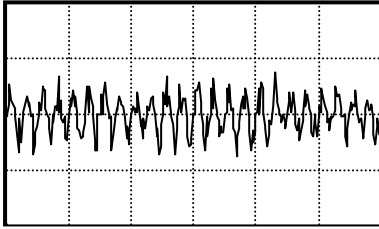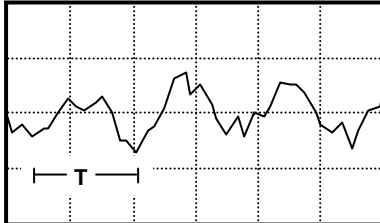
Fig. 2: Random voltage with **Rate = 0**

Fig. 3: Random voltage with **Rate = 10**

4 Level

The amplitude of the signal at output **§** is adjusted with this control.

5 Random Control

Use these two LEDs to keep track of whether the **random voltage** is **positive** (+) or **negative** (-) at any point in time.   Their relative brightness also shows amplitude.

4. Outputs

!   White

Output **!** produces **white noise**.

"   Colored

Output **"** produces **coloured noise,** whose spectrum is determined by the position of controls **1** and **2**.

§ Random Output

Output **§** produces a **random voltage**, whose rate of change and amplitude are determined by controls **3** and **4**.

5. User examples

The A-118 as wind FX generator

D Patch the A-118 into an A-120 VCF as below. Set CV2 to zero, the frequency to a mid position, and the resonance to just below self-oscillation.

D Now increase CV2's level. An irregular wind sound should emerge. Knobs **3** and **4** on the A-118 control the rate of change and amount of this irregularity. **1** and **2** control the wind's timbral content.
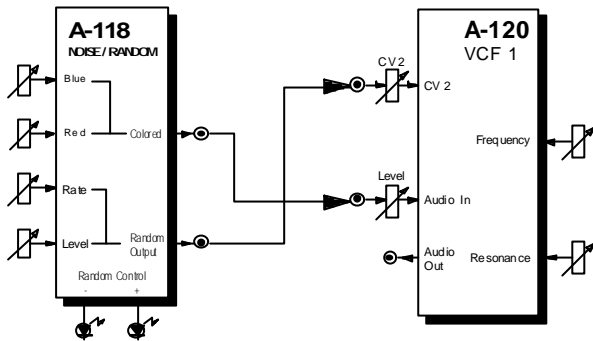

Fig. 4: Using the A-118 and A-120 for wind noises

Random arpeggios

In this example, momentary random voltages from the A-118's random output are captured by a **Sample & Hold Module** which is itself triggered by an LFO. Every time the LFO completes a cycle, a new random note is played by the VCO. It's possible to patch a VCA in before the VCO, and, by adjusting the gain and output parameters, control the frequency range of the arpeggios.
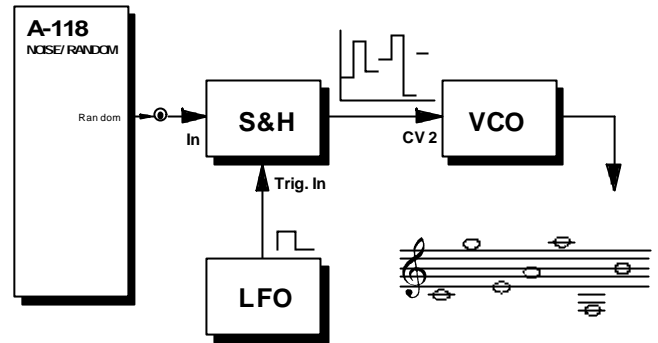

Fig. 5: Rhythmic random arpeggios

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6. Patch-Sheet

The following diagrams of the module can help you recall your own **Patches**. They're designed so that a complete 19" rack of modules will fit onto an A4 sheet of paper.

Photocopy this page, and cut out the pictures of this and your other modules. You can then stick them onto another piece of paper, and create a diagram of your own system.

Make multiple copies of your composite diagram, and use them for remembering good patches and set-ups.

P   • Draw in patchleads with colored pens.
            • Draw or write control settings in the little white circles.